

CONNECTING THE CCSS-M & SMARTER BALANCED ASSESSMENT

Implications for Instruction: Part II

Smarter Balanced Item & Task Specifications as defined by the Mathematics Content Specifications:



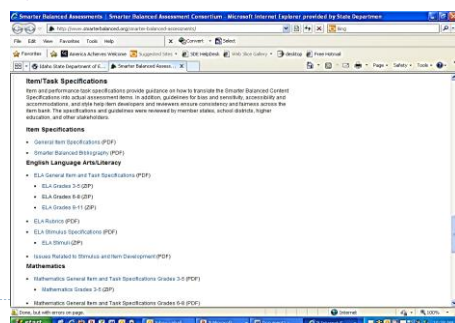
Nichole Hall, SDE Assessment Coordinator
Nancy Thomas Price, Formative/Interim Assessment Coordinator



Webpages we will be visiting:

Smarter Balanced Item Specifications

<http://www.smarterbalanced.org/smarter-balanced-assessments/>



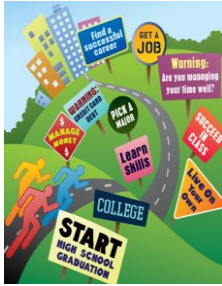
Webpages we will be visiting: Smarter Balanced:

Newly Released Items & Performance Tasks

<http://www.smarterbalanced.org/sample-items-and-performance-tasks/>



Documents we will be using:



► **Common Core State Standards for Mathematics**

http://www.sde.idaho.gov/site/common/math/docs/CCSSI_Math_Standards.pdf

► **SBAC Draft Math Content Specifications**

<http://www.smarterbalanced.org/wordpress/wp-content/uploads/2011/12/Math-Content-Specifications.pdf>

► [L](#)

Mathematics

Item Specifications from Smarter
Balanced website

Item Specifications – Claim 1

<http://www.smarterbalanced.org/smarter-balanced-assessment>

Grade 6 Mathematics Item Specification C1 TD

Grade 6 Math C1 TD

Claim 1: Concepts and Procedures

Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Content Domain: The Number System

Target D [m]: Apply and extend previous understandings of numbers to the system of rational numbers. (DOK 1, 2)

Tasks for this claim will ask students to place numbers on a number line (positive and negative rational numbers, including those expressed using absolute value notation). Some tasks will ask students to interpret the meaning of zero in a context related to other given quantities in the problem.

Claim 3 tasks will integrate the work of this target by incorporating students' understanding of interpretations and explanations of common misconceptions related to inequalities for negative rational numbers (e.g., explaining that -3°C is warmer than -7°C). Claims 2 and 4 will include items that ask students to solve problems in the four quadrants of the coordinate plane, including distances between points with the same first and second coordinate.

Standards: 6.NS.5, 6.NS.6, 6.NS.7, 6.NS.8

DOK Target(s): 1, 2

Evidence Required: 1. The student locates and positions integers and other rational numbers on a number line.

2. The student represents the absolute value of a rational

Evidence for
Assessment Target –
Content Specifications

Item Specifications: Claim 1

Targets \leq 7, and 10.	Standards: 6.G.1, 6.G.2, 6.G.3, 6.G.4
DOK Target(s):	1, 2
Evidence Required:	<ol style="list-style-type: none"> 1. The student determines the area of triangles, special quadrilaterals, and polygons using composition and decomposition in solving real-world and mathematical problems. 2. The student determines the volume of right rectangular prisms with fractional edge lengths in solving real-world and mathematical problems. 3. The student identifies nets of three-dimensional figures in the context of solving real-world and mathematical problems. 4. The student determines the surface area of three-dimensional figures formed by nets of polygons in the context of solving real-world and mathematical problems. 5. The student draws polygons in the coordinate plane, given coordinates for the vertices in the context of solving real-world and mathematical problems. 6. The student determines the length of a side of a polygon in the coordinate plane, given coordinates for the vertices in the context of solving real-world and mathematical problems. 7. The student determines one or more missing coordinates in the coordinate plane that would complete the drawing of a polygon in the context of solving real-world and mathematical problems.

Item Specifications: Claim 1

a triangle, special quadrilateral, or other polygon.	
<ol style="list-style-type: none"> 1. CR (DOK 2) Prompt Features: The student is prompted to use composition and decomposition to determine the areas of triangles, special quadrilaterals, and polygons in solving real-world and mathematical problems. Stimulus: The student is presented with a real-world or mathematical problem involving composition or decomposition of a triangle, special quadrilateral, or other polygon. 2. SR (DOK 1, 2) Prompt Features: The student is prompted to identify the volume of a right rectangular prism by packing it with unit cubes of the appropriate unit fraction edge lengths. Or the student is prompted to identify the volume of a right rectangular prism by applying the formulas $V = lwh$ and $V = bh$. Stimulus: The student is presented with a right rectangular prism with fractional edge lengths. 2. CR (DOK 1, 2) Prompt Features: The student is prompted to determine the volume of a right rectangular prism by packing it with unit cubes of the appropriate unit fraction edge lengths. Or the student is prompted to determine the volume of a right rectangular prism by applying the formulas $V = lwh$ and $V = bh$. Stimulus: The student is presented with a right rectangular prism with fractional edge lengths. 3. SR (DOK 2) Prompt Features: The student is prompted to identify the three-dimensional figure that would be formed from a net. Stimulus: The student is presented with a net composed of rectangular, triangles, or a combination of the two in the context 	

Item Types

- ▶ SR – Selected Response
- ▶ CR – Constructed Response
- ▶ ER – Extended Response
- ▶ PT – Performance Task
- ▶ TE – Technology Enhanced

Various Item Types: Connecting Content & Practice

Content & Procedures

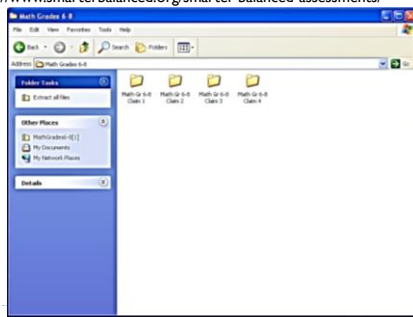
- Selected Response
- Constructed Response
- Technology Enhanced

Demonstrating, Modeling & Explaining

- Extended Response
- Performance Task
- May be enhanced with technology

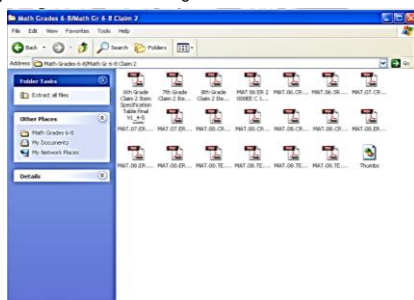
Item Specifications – Claims 2, 3, & 4

<http://www.smarterbalanced.org/smarter-balanced-assessments/>



Item Specifications – Claims 2, 3, & 4

<http://www.smarterbalanced.org/smarter-balanced-assessments/>



Item Specifications – Claims 2, 3, & 4

<http://www.smarterbalanced.org/smarter-balanced-assessments/>

Grade 6 Mathematics Item Specification Claim 2



Grade 6 Math Claim 2

Primary Claim 2: Problem Solving

Students can solve a range of well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.

Secondary Claim(s): Items/tasks written primarily to assess Claim 2 will necessarily involve some Claim 1 content targets. Related Claim 1 targets should be listed below the Claim 2 targets in the Item form. If Claim 3 or 4 targets are also directly related to the Item/task, list those following the Claim 1 targets in order of prominence.

Primary Content Domain: Each Item/task should be classified as having a primary, or dominant, content focus. The content should draw upon the knowledge and skills articulated in the progression of standards leading up to Grade 6.

Secondary Content Domain(s): While tasks developed to assess Claim 2 will have a primary content focus, components of these tasks will likely produce enough evidence for other content domains that a separate listing of these content domains will need to be included where appropriate.

Assessment Targets: Any given item/task should provide evidence for several Claim 2 assessment targets. Each of the following targets should not lead to a separate task; it is in using context from different areas, including work studied in earlier grades, that students demonstrate their problem-solving proficiency. Multiple targets should be listed in order of prominence as related to the item/task.

Target A: Apply mathematics to solve well-posed problems arising in everyday life, society, and the workplace. (DOK 2, 3)
Under claim 2, the problems should be completely formulated, and students should be asked to find a solution path from among their readily available tools.

Item Specifications – Claims 2, 3, & 4

<http://www.smarterbalanced.org/smarter-balanced-assessments/>

Claim 2 Rationale:

Mathematical Practice 1: Make sense of problems and persevere in solving them.

Mathematically proficient students:

- explain to themselves the meaning of a problem and look for entry points to its solution.
- analyze givens, constraints, relationships, and goals.
- make conjectures about the form and meaning of the solution attempt.
- plan a solution pathway rather than simply jump into a solution.
- consider analogous problems and try special cases and simpler forms of insight into the solutions.
- monitor and evaluate their progress and change course if necessary.
- transform algebraic expressions or change the viewing window on their graphing calculator to get information.
- explain correspondences between equations, verbal descriptions, tables, and graphs.
- draw diagrams of important features and relationships, graph data, and search for regularity or trends.
- use concrete objects or pictures to help conceptualize and solve a problem.
- check their answers to problems using a different method.

Item Specifications – Claims 2, 3, & 4

<http://www.smarterbalanced.org/smarter-balanced-assessments/>

- slope as they repeatedly check whether the points are on the line through (1, 2) with a slope 3.
- maintain oversight of the process of solving a problem, while attending to the details.
- continually evaluate the reasonableness of intermediate results.

Allowable Item Types*:

SR, CR, ER, TE

Task Models:

Problems in pure mathematics. These are well-posed problems within mathematics where the student must find an approach, choose which mathematical tools to use, carry the solution through, and explain the results.

Design problems. These are well-posed problems within a real- or fantasy-world context where the student must find an approach, choose which mathematical tools to use, carry the solution through, and explain the results.

Planning problems. Planning problems involve the coordinated analysis of time, space, cost, and people. They are design tasks with a time dimension added. Well-posed problems of this kind assess the student's ability to make the connections needed between different parts of mathematics.

Item Specifications

What are the implications for instruction?

Implications for Instruction



Smarter Balanced
Assessment Consortium:
Preliminary Test Blueprints

November 28, 2012

Draft form

Item Specifications

Interpreting the Item Specifications

Understanding the Item

Grade 6 Mathematics Sample SR Item C1 TA

Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

1. Content & Grade
2. Type of Question
 - a. SR – Selected Response
3. Claim
4. Domain : RP – Ratios and Proportional Relationships
5. Assessment Target for Grade Level – Target A
6. Internal Number - 181
7. Claim – C1, C2, C3, or C4 & Target– Found in Math Content Specifications

Understanding the Item Specifications

“Claims are the broad statements of the assessment system’s learning outcomes, each of which requires evidence that articulates the types of data/observations that will support interpretations of competence towards achievement of the claims.” p. 18 –

Math Content Specifications

Sample SR Item C1 TA

P.A.181 C1 TA
0: MAT.06.SR.1.000RP.A.181
0: 06
0: Claim 1: Concepts and Procedures
0: Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
0: 1 A: Understand ratio concepts and use ratio reasoning to solve problems.
0: Ratios and Proportional Relationships
0: 6.RP.3
0: 1, 2
0: 2
0: SR
0: 1
0: M
0: D
0: Stimulus/Source:
0: Target-Specific Attributes (e.g., accessibility issues):
0: Notes:



Understanding the Item Specifications

Assessment Target	
"Cluster-level headings of the standards in the CCSS-M are used in order to allow for the creation and use of assessment tasks that require proficiency in a broad range of content and practices. Use of more fine-grained descriptions would risk a tendency to atomize the content, which might lead to assessments that would not meet the intent of the standards." Content Specs., p. 20	
Grade 6 Mathematics	Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
MAT.06.SR.1.000RP.A.181 C1 TA	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Sample Item ID:	Ratios and Proportional Relationships
Grade:	6.RP.3
Claim(s):	1, 2
Assessment Target(s):	2
Content Domain:	SR
Standard(s):	1
Mathematical Practice(s):	M
DOK:	D
Item Type:	
Score Points:	
Difficulty:	
Key:	
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Understanding the Item Specifications

Smarter Balanced Assessment Consortium	
Grade 6 Mathematics Sample SR Item C1 TA	
MAT.06.SR.1.000RP.A.181 C1 TA	
Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Domain Domains, as found in the CCSS-M, are larger groups of related standards.

Understanding the Item Specifications


Smarter Balanced Assessment Consortium	
Grade 6 Mathematics Sample SR Item C1 TA	
MAT.06.SR.1.000RP.A.181 C1 TA	
Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Standard(s) Defines what students should understand and be able to do


Understanding the Item Specifications

Grade 6	Standards for Mathematical Practice "Describe varieties of expertise that mathematics educators at all levels should seek to develop in their students." CCSS-M pp.6-8
MAT.06.SR.1.000RP.A.181 C1 TA	
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Understanding the Item Specifications

Grade 6 Mathematics Sample SR Item C1 TA	
MAT.06.SR.1.000RP.A.181 C1 TA	
Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and
Assessment Target(s):	Selected Response - Includes computer-enhanced items - Distractors are chosen to embody common misconceptions - Designed to make sure that students do not obtain correct answers because of test-taking skills
Content Domain:	
Standard(s):	
Mathematical Practice(s):	
DOK:	
Item Type:	
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Understanding the Item Specifications

Grade 6 Mathematics Sample SR Item C1 TA	
MAT.06.SR.1.000RP.A.181 C1 TA	
Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
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Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Range of Difficulty -
Estimation until pilot
assessment occurs.

Understanding the Item Specifications

Grade 6 Mathematics Sample SR Item C1 TA

**Smarter
Balanced**
Assessment Consortium

MAT.06.SR.1.000RP.A.181 C1 TA

Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems. 6.RP.3: Ratios and Proportional Relationships
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Key – Correct Answer

Understanding the Item Specifications

Grade 6 Mathematics Sample SR Item C1 TA

**Smarter
Balanced**
Assessment Consortium

MAT.06.SR.1.000RP.A.181 C1 TA

Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems. 6.RP.3: Ratios and Proportional Relationships
Content Domain:	6.RP.3: Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Depth of Knowledge
The cognitive rigor that a student needs to bring to the item/task, as determined by the **Cognitive Rigor Matrix**, Math Content Specifications, Appendix C, p. 92

Item Development: Content

		PRIMARILY Selected Response Constructed Response Extended Response SECONDARILY Performance Task
Claim #1	Concepts & Procedures "Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency."	Constructed Response Extended Response Performance
Claim #2	Problem Solving "Students can solve a range of problems and apply mathematics, making productive use of knowledge and problem solving strategies."	
Claim #3	Communicating Reasoning "Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others."	
Claim #4	Modeling and Data Analysis "Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems."	

Item Development: Content Specifications

Primary Claim 2: Problem Solving Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.

Secondary Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Primary Domain: Expressions and Equations
Secondary Domain: The Number System

2.A: Apply mathematics to solve well-posed problems arising in everyday life, society, and the workplace.
1.B: Work with radicals and integer exponents.
1.A: Know that there are numbers that are not rational, and approximate them by rational numbers.

Standards: 8.EE.3, 8.NS.2
Mathematical Practices: 1, 2, 4, 5, 6, and 7

Item Development: Item Specifications

Primary Claim - Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Primary Domain: Ratios and Proportional Relationships

1.A: Analyze proportional relationships and use them to solve real-world and mathematical problems.
2.C: Interpret results in the context of a situation.

Standard(s): 7.RP.2
Mathematical Practice(s): 1, 2

Item Development: Item Specifications

Primary Claim - Claim 2: Problem Solving Students can solve a range of well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.

Primary Domain: Geometry
Secondary Domain: Ratio & Proportional Reasoning

2.F: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
2.A: Analyze proportional relationships and use them to solve real-world and mathematical problems.

Standard(s): 7.G.4, 7.RP.3
Mathematical Practice(s): 1, 2, 6

Mathematics

Sample Items from Smarter Balanced site

Math – Selected Response

Grade 6 Mathematics Sample SR Item C1 TA



MAT.06.SR.1.000RP.A.181 C1 TA

Sample Item ID:	MAT.06.SR.1.000RP.A.181
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Math – Selected Response

Selected Response

Grade 6

MAT.06

- Includes computer-enhanced items
- Distractors are chosen to embody common misconceptions
- Designed to make sure that students do not obtain correct answers because of test-taking skills

Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 A: Understand ratio concepts and use ratio reasoning to solve problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	6.RP.3
Mathematical Practice(s):	1, 2
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	D
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Depth of Knowledge

Math – Selected Response

In art class, Marvin painted tiles to use for a project. For every 5 tiles he painted blue, he painted 8 tiles green.

Identify the equivalent ratio(s) of blue tiles to green tiles. Select all that apply.

- (A) 20:23
(B) 40:25
(C) 50:800
(D) 60:96

Key and Distractor Analysis:

- A. Thought that any difference of 3 is equivalent.
B. Reversed the ratio (green to blue).
C. Saw the 5 and 8 and didn't pay attention to the place value.
D. Key

Math – High School SR



HS Mathematics Sample SR Item C1 TK

MAT.HS.SR.1.00FIF.K.082

Sample Item ID:	MAT.HS.SR.1.00FIF.K.082
Grade:	HS
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 K: Understand the concept of notation.
Content Domain:	Functions
Standard(s):	F-IF.1
Mathematical Practice(s):	4, 6
DOK:	2
Item Type:	SR
Score Points:	1
Difficulty:	M
Key:	YNNY
Stimulus/Source:	
Target-specific attributes (e.g., accessibility issues):	
Notes:	Multi-Answer Item

Multiple Answer Item

Math – High School SR

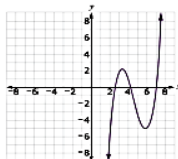
For numbers 1a – 1d, determine whether each relation is a function.

1a. $\{(0,1), (1,2), (3,1), (4,2)\}$

☐ Yes ☐ No

1b. $y = \pm\sqrt{4 - x^2}$

☐ Yes ☐ No



1c.

☐ Yes ☐ No

1d. $\{(5,3), (2,4), (5,2)\}$

☐ Yes ☐ No

Math – High School SR

Key and Distractor Analysis:1a. Y $\{(0,1),(1,2),(3,1),(4,2)\}$

All x-coordinates are unique, so it meets the definition of a function.

1b. N $y = \pm\sqrt{4-x^2}$ An input of $x = 1$ has two corresponding outputs, $y = \sqrt{3}$ and $y = -\sqrt{3}$, so it fails to meet the definition of a function.

1c. Y This is a function since for each value chosen along the x-axis, there is exactly one y-value on the graph that corresponds to it.

1d. N This is not a function since the input of 5 has two corresponding output values, 3 and 2.

Math – Constructed Response

Grade 5 Mathematics Sample CR Item Claim 2



MAT.05.CR.2.000MD.C.555 Claim 2

Sample Item ID:	MAT.05.CR.2.000MD.C.555
Grade:	05
Primary Claim:	Claim 2: Problem Solving Students can solve a range of well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.
Secondary Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Primary Content Domain:	Measurement and Data
Secondary Content Domain(s):	
Assessment Target(s):	2 C: Interpret results in the context of a situation. 1 G: Convert like measurement units within a given measurement system.
Standard(s):	5.MD.1
Mathematical Practice(s):	1, 2, 5
DOK:	2
Item Type:	CR
Score Points:	1
Difficulty:	M
Key:	120
Stimulus/Source:	
Target-Specific Attributes (e.g., Accessibility Issues):	
Notes:	

Math – Constructed Response

Grade 5 Mathematics Sample CR Item Claim 2

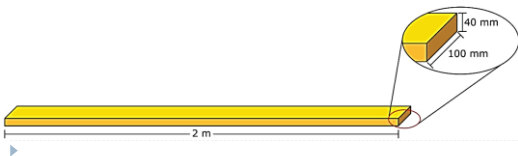


MAT.05.CR.2.000MD.C.555 Claim 2

Constructed Response	
<ul style="list-style-type: none"> Items can assess mathematical thinking directly. Items can provide direct evidence on students' mastery of standard procedures. 	
Primary & Secondary Claims	and fluency. Measurement and Data 2 C: Interpret results in the context of a situation. 1 G: Convert like measurement units within a given measurement system. 5.MD.1 Mathematical Practice(s): 1, 2, 5 DOK: 2 Item Type: CR Score Points: 1 Difficulty: M Key: 120 Stimulus/Source: Target-Specific Attributes (e.g., Accessibility Issues): Notes:
Multiple Assessment Targets	

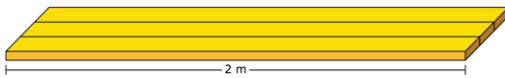
Math – Constructed Response

Shelbi needs wooden boards to build a platform. Each board is shaped like a rectangular prism and has a length of 2 meters, a height of 40 millimeters, and a width of 100 millimeters, as shown below.



Math – Constructed Response

To build the platform, Shelbi will place the boards side by side, as shown in this diagram. The platform will have a total width of 12 meters.



What is the **least** number of boards that Shelbi needs to build the platform?

Boards

Math – Extended Response

Grade 7 Mathematics Sample ER Item

MAT.07.ER.3.000EE.D.156



Sample Item ID:	MAT.07.ER.3.000EE.D.156
Grade:	07
Primary Claim:	Claim 3: Communicating Reasoning Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.
Secondary Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.
Primary Content Domain:	Expressions and Equations
Secondary Content Domain(s):	The Number System
Assessment Target(s):	3 A: Test propositions or conjectures with specific examples.
Standard(s):	1 D: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
Mathematical Practice(s):	7.EE.3, 7.EE.1, 7.NS.2
DOK:	3
Item Type:	ER
Score Points:	3
Difficulty:	14
Key:	See Sample Top-Score Response.
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	Part of PT set; some of the task can be AI scored.

Math – Extended Response

Multiple Claims, Domains, Assessment Targets, Standards and Mathematical Practices	Mathematics Sample ER Item 3.000EE.D.156	Smarter Balanced
	Extended Response Items require a more solid demonstration of conceptual understanding and procedural skills.	
	Extended Response Tasks	
	Application	
	Translation	
	Explanation	

Math – Extended Response

Renee, Susan, and Martha will share the cost to rent a vacation house for a week.

- Renee will pay 40% of the cost.
- Susan will pay 0.35 of the cost.
- Martha will pay the remainder of the cost.

Part A

Martha thinks that she will pay $\frac{1}{3}$ of the cost. Is Martha correct? Use mathematics to justify your answer.

Part B

The cost to rent a vacation house for a week is \$850. How much will Renee, Susan, and Martha each pay to rent this house for a week?

Renee will pay \$ _____
 Susan will pay \$ _____
 Martha will pay \$ _____

Extended Response: Scoring Rubric

- Responses to this item will receive 0–3 points, based on the following:
- 3 points:** The student shows a thorough understanding of how solving a real-world problem can lead to flawed reasoning. The student shows a thorough understanding of solving a real-world problem involving numeric expressions with rational numbers. This is shown by the student indicating that Martha is incorrect with justification and correctly calculates the amount each person pays.
- 2 points:** The student shows good understanding of solving a real-world problem involving numeric expressions with rational numbers. The student recognizes that Martha will not pay $\frac{1}{3}$ of the cost, but makes a minor error in showing the calculations to support the response to Part A. This error is then consistently applied in responding to Part B.
- 1 point:** The student shows limited understanding of solving a real-world problem involving numeric expressions with rational numbers. The student can correctly calculate Renee's and/or Susan's portion of the trip, but other parts of the response are incorrect.
- 0 points:** The student shows inconsistent or no understanding of how solving a real-world problem can lead to flawed reasoning or how to solve a real-world problem involving numeric expressions with rational numbers. Simply claiming that Martha's portion of the trip rental is not equal to $\frac{1}{3}$ is not sufficient to earn any points.

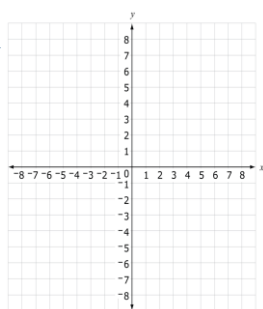
Math – Technology Enhanced

Grade 7 Mathematics Sample TE Item



MAT.07.TE.1.000RP.A.287

Sample Item ID:	MAT.07.TE.1.000RP.A.287
Grade:	07
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1.A: Analyze proportional relationships and use them to solve real-world and mathematical problems.
Content Domain:	Ratios and Proportional Relationships
Standard(s):	7.RP.2
Mathematical Practice(s):	2, 4, 5
DOCK:	2
Item Type:	TE
Score Points:	1
Difficulty:	M
Key:	Graph of $y=2x$
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	TE Template: Single Line



The value of y is proportional to the value of x . The constant of proportionality for this relationship is 2. On the grid below, graph this proportional relationship.

[Create two points by clicking on the intersections of the gridlines. When you create the second point, a line will automatically be drawn through the two points. If you make a mistake, use the Clear button to begin again.]

Scoring

▶ Key and Distractor Analysis:

Student must select two of these points: $(-4, -8)$, $(-3, -6)$, $(-2, -4)$, $(-1, -2)$, $(0, 0)$, $(1, 2)$, $(2, 4)$, $(3, 6)$, $(4, 8)$.

▶ Scoring Rule: Based on the scoring rule, students that create a line with y -intercept $(0, 0)$ and slope of 2 will receive 1 point.

All other lines will receive 0 points.

Math – Technology Enhanced

43057

A construction worker is using wooden beams to reinforce the back wall of a room.



Determine the height, in feet, of the beam that ends at point G. Explain how you found your answer.

Math – Performance Task

Grade 8 Mathematics Sample PT Form



MAT.08.PT.4.MYPET.A.415

Sample Item ID:	MAT.08.PT.4.MYPET.A.415
Title:	Cost of a Pet
Grade:	08
Primary Claim:	Claim 4: Modeling and Data Analysis Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.
Secondary Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency. Claim 2: Problem Solving Students can solve a range of well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.
Primary Content Domain:	Statistics and Probability
Secondary Content Domain(s):	Functions

Math – Performance Task

Grade Level
Content
Type of Item
a. PT – Performance
Task

Grade 8 Mathematics Sample PT Form

MAT.08.PT.4.MYPET.A.415

Sample Item ID:	MAT.08.PT.4.MYPET.A.415
Title:	Cost of a Pet
Grade:	08
Primary Claim:	Claim 4: Modeling and Data Analysis Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.
Secondary Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency. Claim 2: Problem Solving Students can solve a range of well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.
Primary Content Domain:	Statistics and Probability
Secondary Content Domain(s):	Functions

Primary and Secondary Claims

Domain Domains, as found in the CCSS-M, are larger groups of related standards.

Math – Performance Task

Assessment Target(s) Multiple Cluster Level Headings	<p>Assessment Target(s):</p> <p>4 A: Apply mathematics to solve problems arising in everyday life, society, and the workplace.</p> <p>1 C: Understand the connections between proportional relationships, lines, and linear equations.</p> <p>1 F: Use functions to model relationships between quantities.</p> <p>1 D (Gr 7): Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</p> <p>1 A (Gr 6): Understand ratio concepts and use ratio reasoning to solve problems.</p> <p>1 D (Gr 5): Perform operations with multi-digit whole numbers and with decimals to hundredths.</p> <p>2 B: Select and use appropriate tools strategically.</p> <p>2 C: Interpret results in the context of a situation.</p> <p>4 B: Construct, autonomously, chains of reasoning to justify mathematical models used, interpretations made, and solutions proposed for a complex problem.</p> <p>4 D: Interpret results in the context of a situation.</p> <p>4 E: Analyze the adequacy of and make improvements to an existing model or develop a mathematical model of a real phenomenon.</p>
	<p>4 F: Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas).</p> <p>4 G: Identify, analyze and synthesize relevant external resources to solve or solve problems.</p>

Math – Performance Task

Standard(s):	8.EE.6, 8.F.4, 7.EE.3, 6.RP.2, 5.NBT.7
Mathematical Practice(s):	1, 2, 4, 5, 6
DOK:	4
Item Type:	PT
Score Points:	11
Difficulty:	M
How this task addresses the "sufficient evidence" for this claim:	The student must use information derived from research to estimate the costs to adopt and maintain a pet. This work will be supported by the use of calculations, graphical representation of data, and generalizations using algebra.
Target-Specific Attributes (e.g., accessibility issues):	Accommodations may be necessary for students who have visual challenges. Technology is needed to enable students to create a circle graph, bar graph, or line graph.
Stimulus/Source:	www.petsmart.com
Notes:	Multi-part task

Math – Performance Task

Item type:	PT
Score Points:	11
Difficulty:	M
How this task addresses the "sufficient evidence" for this claim:	The student must use information derived from research to estimate the costs to adopt and maintain a pet. This work will be supported by the use of calculations, graphical representation of data, and generalizations using algebra.
Target-Specific Attributes (e.g., accessibility issues):	Accommodations may be necessary for students who have visual challenges. Technology is needed to enable students to create a circle graph, bar graph, or line graph.
Stimulus/Source:	www.petsmart.com
Notes:	Multi-part task
Task Overview:	<p>Prework: In groups or as a whole class, students brainstorm what items are needed to maintain a pet over time.</p> <p>Day 1: With partners, students decide which type of pet they want to adopt. Students use a set of provided "Web sites" to look up the costs of necessary items for the chosen pet.</p> <p>Day 2: Students individually estimate the cost of adopting and maintaining their chosen pet for 1 year. Students explain why their estimate is reasonable. As part of the explanation, the student must make and refer to a line graph showing the monthly increase in money spent over the year.</p>
Teacher Preparation / Resource Requirements:	Teacher preparation: The day before the administration of the task, there is prework that is designed to encourage students to begin thinking about the upcoming task. The prework involves a class brainstorming session and discussion. The remainder of the task involves a group assignment for one day followed by scored portions of the task on the second day.

Math – Performance Task

Cost of Owning and Caring for a Pet**Part A**

Enter the list of pet items and costs you created yesterday, including the initial cost to buy or adopt your pet.

Based on your research, estimate the cost of adopting and maintaining a pet (dog, cat, hamster, parakeet) for one year.

You may click on the links to the Web pages you looked at yesterday to help you revise or adjust your list in order to determine the cost for an entire year.

Math – Performance Task

Part B

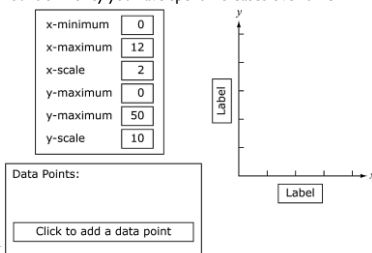
What do you estimate the cost of adopting and maintaining a pet (dog, cat, hamster, parakeet) for one year is?

Provide a thorough explanation below that proves you have thought of all the costs associated with owning your choice of pet. Be sure to account for all one-time costs, as well as recurring costs and the frequency of those costs.

Adjust your total above if needed.

Math – Performance Task

Next, support your answer by using the line graph tool to create a line graph that shows the months of the year and the total amount of money you have spent on your pet through the end of each month. Your graph should show how the amount of money you have spent increases over time



Math – Performance Task

Part C

Estimate the cost of maintaining your pet (dog, cat, hamster, parakeet) for *one additional year* after the first.

Again, provide a thorough explanation below that proves you have thought of all the costs associated with owning your choice of pet for one *additional year*.



Math – Performance Task

Part D

Write a linear equation that best fits the total cost of adopting and maintaining your pet for a given number of *months*. Assume that your pet will not need to go to the veterinarian throughout this time.

Equation:

Explain how you created your model equation. Be sure to describe what the variables represent and how you determined the slope and intercept for your equation.



Item Alignment Practice

Smarter Balanced Item

Smarter Balanced Item

Hisaki is making sugar cookies for a school bake sale. He has $3\frac{1}{2}$ cups of sugar. The recipe calls for $\frac{3}{4}$ cup of sugar for one batch of cookies. Which equation can be used to find b , the total number of batches of sugar cookies Hisaki can make?

(A) $3\frac{1}{2} \times \frac{3}{4} = b$

(B) $3\frac{1}{2} \div \frac{3}{4} = b$

(C) $3\frac{1}{2} + b = \frac{3}{4}$

(D) $3\frac{1}{2} - b = \frac{3}{4}$

Item Specification

Grade 6 Mathematics Sample SR Item C1 TB

Sample Item ID:	
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 B: Apply and extend previous understandings of multiplication and division to divide fractions by fractions. 1 F: Reason about and solve one-variable equations and inequalities.
Content Domain:	The Number System
Standard(s):	6.NS.1, 6.EE.6
Mathematical Practice(s):	1, 2
DOK:	1
Item Type:	SR
Score Points:	1
Difficulty:	L
Key:	B
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Hisaki is making sugar cookies for a school bake sale. He has $3\frac{1}{2}$ cups of sugar. The recipe calls for $\frac{3}{4}$ cup of sugar for one batch of cookies. Which equation can be used to find b , the total number of batches of sugar cookies Hisaki can make?

(A) $3\frac{1}{2} \times \frac{3}{4} = b$

(B) $3\frac{1}{2} \div \frac{3}{4} = b$

(C) $3\frac{1}{2} + b = \frac{3}{4}$

(D) $3\frac{1}{2} - b = \frac{3}{4}$

Item Specification

Grade 6 Mathematics Sample SR Item C1 TB

Sample Item ID:	
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	6.NS.1: Interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions. CCSS, p. 42
Content Domain:	The Number System
Standard(s):	6.NS.1
Mathematical Practice(s):	1, 2
DOK:	1
Item Type:	SR
Score Points:	1
Difficulty:	L
Key:	B
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Hisaki is making sugar cookies for a school bake sale. He has $3\frac{1}{2}$ cups of sugar. The recipe calls for $\frac{3}{4}$ cup of sugar for one batch of cookies. Which equation can be used to find b , the total number of batches of sugar cookies Hisaki can make?

(A) $3\frac{1}{2} \times \frac{3}{4} = b$

(B) $3\frac{1}{2} \div \frac{3}{4} = b$

(C) $3\frac{1}{2} + b = \frac{3}{4}$

(D) $3\frac{1}{2} - b = \frac{3}{4}$

Item Specification

Grade 6 Mathematics Sample SR Item C1 TB

Sample Item ID:	06
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and
Assessment Target:	6.EE.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set. CCSS, p. 44
Content Area:	Mathematics
Item Type:	SR
Score Points:	1
Difficulty:	L
Key:	B
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Hiroki is making sugar cookies for a school bake sale. He has $3\frac{1}{2}$ cups of sugar. The recipe calls for $\frac{3}{4}$ cup of sugar for one batch of cookies. Which equation can be used to find b , the total number of batches of sugar cookies Hiroki can make?

Ⓐ $3\frac{1}{2} + \frac{3}{4} = b$

Ⓑ $3\frac{1}{2} + \frac{3}{4} = b$

Ⓒ $3\frac{1}{2} \div b = \frac{3}{4}$

Ⓓ $3\frac{1}{2} \div b = \frac{3}{4}$

Item Specification

Grade 6 Mathematics Sample SR Item C1 TB

Sample Item ID:	06
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and
Assessment Target:	6.EE.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set. CCSS, p. 44
Content Area:	Mathematics
Item Type:	SR
Score Points:	1
Difficulty:	L
Key:	B
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Hiroki is making sugar cookies for a school bake sale. He has $3\frac{1}{2}$ cups of sugar. The recipe calls for $\frac{3}{4}$ cup of sugar for one batch of cookies. Which equation can be used to find b , the total number of batches of sugar cookies Hiroki can make?

Ⓐ $3\frac{1}{2} + \frac{3}{4} = b$

Ⓑ $3\frac{1}{2} + \frac{3}{4} = b$

Ⓒ $3\frac{1}{2} \div b = \frac{3}{4}$

Ⓓ $3\frac{1}{2} \div b = \frac{3}{4}$

Mathematical Practice 1: Make sense of problems and persevere in solving them

Mathematical Practice 2: Reason abstractly and quantitatively

Item Specification

Grade 6 Mathematics Sample SR Item C1 TB

Sample Item ID:	06
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and
Assessment Target:	6.EE.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set. CCSS, p. 44
Content Area:	Mathematics
Item Type:	SR
Score Points:	1
Difficulty:	L
Key:	B
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Hiroki is making sugar cookies for a school bake sale. He has $3\frac{1}{2}$ cups of sugar. The recipe calls for $\frac{3}{4}$ cup of sugar for one batch of cookies. Which equation can be used to find b , the total number of batches of sugar cookies Hiroki can make?

Ⓐ $3\frac{1}{2} + \frac{3}{4} = b$

Ⓑ $3\frac{1}{2} + \frac{3}{4} = b$

Ⓒ $3\frac{1}{2} \div b = \frac{3}{4}$

Ⓓ $3\frac{1}{2} \div b = \frac{3}{4}$

Cluster Heading: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
CCSS, p. 42

Assessment Target B – Content Specifications, p. 40

Item Specification

Grade 6 Mathematics Sample SR Item C1 TB

Sample Item ID:	06
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and
Cluster Heading:	Apply and extend previous understandings of multiplication and division to divide fractions by fractions. CCSS, p. 42
Assessment Target B – Content Specifications, p. 40	
DOK:	1
Item Type:	SR
Score Points:	1
Difficulty:	L
Key:	B
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Hissel is making sugar cookies for a school bake sale. He has $3\frac{1}{2}$ cups of sugar. The recipe calls for $\frac{3}{4}$ cup of sugar for one batch of cookies. Which equation can be used to find b , the total number of batches of sugar cookies Hissel can make?

Ⓐ $3\frac{1}{2} \div \frac{3}{4} = b$

Ⓑ $3\frac{1}{2} \times \frac{3}{4} = b$

Ⓒ $3\frac{1}{2} \div b = \frac{3}{4}$

Ⓓ $3\frac{1}{2} \times b = \frac{3}{4}$

Item Specification

Grade 6 Mathematics Sample SR Item C1 TB



MAT.06.SR.1.000NS.B.179 C1 TB

Sample Item ID:	MAT.06.SR.1.000NS.B.179
Grade:	06
Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 B: Apply and extend previous understandings of multiplication and division to divide fractions by fractions. 1 F: Reason about and solve one-variable equations and inequalities.
Content Domain:	The Number System
Standard(s):	6.NS.1, 6.EE.6
Mathematical Practice(s):	1, 2
DOK:	1
Item Type:	SR
Score Points:	1
Difficulty:	L
Key:	B
Stimulus/Source:	
Target-Specific Attributes (e.g., accessibility issues):	
Notes:	

Where to go from here...

Instructional Implications

Next Steps

- ▶ Become more familiar with the item specifications and the sample items.
- ▶ Begin using the item specifications and sample items when adjusting current activities, lessons, or units to meet the rigor of the CCSS.
- ▶ Visit the websites provided to view further sample items.

Evaluation

- ▶ Please complete a survey on your experience in participating in Connecting the CCSS-M and Smarter Balanced Assessment, Implications for Instruction: Part II.
 - ▶ *You feedback is greatly appreciated and is used to make adjustments in future trainings!*
- ▶ To access the survey, please visit, <https://www.surveymonkey.com/s/CCSSMSBA>
 - ▶ *Thank you for taking time out of your busy schedule to participate in today's webinar!*

Future Module

- ▶ **ELA/Literacy Content Specifications and Related Documents**

Presented by:

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Nancy Thomas Price – Formative & Interim Assessment Coordinator

Questions



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